

# UTILITY PATENT APPLICATION TRANSMITTAL

(Only for new nonprovisional applications under 37 CFR 1.53(b))

Attorney Docket  
No.

MOT-P-00-001

First Named Inventor or Application Identifier

BRADLEY ENGSTRAND

Express Mail Label No. EL 613928373 US

ADDRESS TO: Assistant Commissioner for Patents  
Box Patent Application  
Washington, DC 20231

## APPLICATION ELEMENTS

See MPEP chapter 600 concerning utility patent application contents.

1. ☒ Specification Total Pages 13
2. ☒ Drawing(s) (35USC 113) Total Pages 01
3. ☒ Declaration and Power of Attorney Total Pages 02
  - a. ☒ Newly executed
  - b. ☐ Copy from prior application (37CFR 1.63(d))  
(for continuation/divisional with Box 14 completed)  
[Note Box 4 Below]
  - i. ☐ DELETION OF INVENTOR(S)  
Signed statement attached deleting  
inventor(s) named in the prior application,  
see 37 CFR 1.63(d)(2) and 1.33(b).
4. ☐ Incorporation By Reference (usable if Box 3b is checked)  
The entire disclosure of the prior application, from which a  
copy of the oath or declaration is supplied under Box 3b,  
is considered as being part of the disclosure of the  
accompanying application and is hereby incorporated by  
reference therein.

## ACCOMPANYING APPLICATION PARTS

5. ☒ Assignment Papers (cover sheet & documentation)  
including check for \$40.00 recordation fee
6. ☐ Letter under 37 CFR 1.41(c).
7. ☐ English Translation Document (if applicable)
8. ☐ Information Disclosure Statement (IDS)/PTO-1449 ☐ Copies of IDS Citations
9. ☐ Preliminary Amendment
10. ☒ Return Receipt Postcard (MPEP 503)  
(Should be specifically itemized)
11. ☒ Small Entity ☐ Statement filed in prior application,  
Statement Status still proper and desired
12. ☐ Certified Copy of Priority Document(s)
13. ☐ Other:

14. If a CONTINUING APPLICATION, check appropriate box and supply the requisite information:

☐ Continuation ☐ Divisional ☐ Continuation-in-part (CIP) ☐ of prior application No: \_\_\_\_\_

### CLAIMS AS FILED

(1) NUMBER OF CLAIMS ALLOWED	(2) NUMBER FILED	(3) NUMBER EXTRA	(4) RATE	(5) BASIC FEE (Small Entity) \$355.00
TOTAL CLAIMS 20	22	2	9 00	18 00
INDEPENDENT CLAIMS 03	03	0	39 00	0
ANY MULTIPLE DEPENDENT CLAIMS? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO			260.00	0
			TOTAL FILING FEE ->	\$373 00

- ☒ The Commissioner is hereby authorized to charge any additional fees which may be required in connection with this application, or credit any overpayment to **DEPOSIT ACCOUNT NO. 50-0595**. A duplicate copy of this sheet is enclosed.
- ☒ A check in the amount of \$ 373.00 to cover the filing fee is enclosed.

## 15. CORRESPONDENCE ADDRESS

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**CERTIFICATE OF MAILING BY EXPRESS MAIL**

**EXPRESS MAIL LABEL NUMBER:** EL 613928373 US

**DATE OF DEPOSIT:** October 17, 2000

I hereby certify that this correspondence is being deposited with the U.S. Postal Service as "EXPRESS MAIL POST OFFICE TO ADDRESSEE" under 37 C.F.R. §1.10 on the date indicated above and is addressed to:

Asst. Commissioner for Patents  
BOX PATENT APPLICATION  
Washington, D.C. 20231

**CONTENTS:**

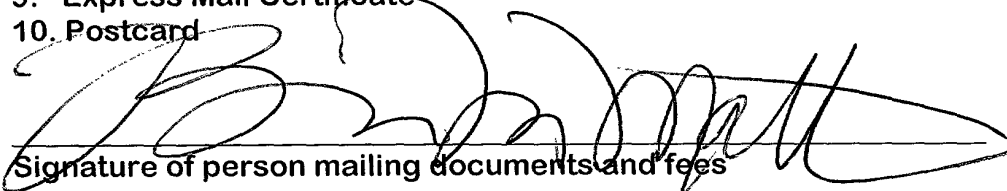
Our Case No.: MOT-P-00-001

Patent application for: Bradley Engstrand

Entitled: "AN APPARATUS, A SYSTEM AND A METHOD FOR POSITION MONITORING AND/OR CLEANING OR A MACHINE ELEMENT"

**ENCLOSED:**

1. Patent Application Transmittal (*in duplicate*)
2. Specification (13 pages)
3. 1 page of Drawings
4. Executed Declaration
5. Executed Small Entity Declaration
6. Executed Assignment
7. Check for \$373.00 Filing Fee (22 claims; 03 independent)
8. Check for \$40.00 Assignment Fee
9. Express Mail Certificate
10. Postcard

  
Signature of person mailing documents and fees

Applicant(s) or Patentee(s) Bradley Engstrand

Attorney's

Docket No.: MOT-P-00-001

Serial or Patent No. \_\_\_\_\_

Filed or Issued: \_\_\_\_\_

For: "AN APPARATUS, A SYSTEM AND A METHOD FOR POSITION MONITORING AND/OR CLEANING OF A MACHINE ELEMENT"

**VERIFIED STATEMENT (DECLARATION) CLAIMING SMALL ENTITY STATUS  
(37 CFR 1.9(f) & 1.27(c)) - SMALL BUSINESS CONCERN**

I hereby declare that I am

☐ the owner(s) of the small business concern identified below:

☐ an official of the small business concern empowered to act on behalf of the concern identified below:

NAME OF CONCERN MOTION CONTROLS, L.L.C.

ADDRESS OF CONCERN 1020 Western Drive, Hartford, Wisconsin 53027

I hereby declare that the above-identified small business concern qualifies as a small business concern as defined in 13 CFR 121.12, and reproduced in 37 CFR 1.9(d), for purposes of paying reduced fees under section 41(a) and (b) of Title 35, United States Code, in that the number of employees of the concern, including those of its affiliates, does not exceed 500 persons. For purposes of this statement, (1) the number of employees of the business concern is the average over the previous fiscal year of the concern of the persons employed on a full-time, part-time or temporary basis during each of the pay periods of the fiscal year, and (2) concerns are affiliates of each other when either, directly or indirectly, one concern controls or has the power to control the other, or a third party or parties controls or has the power to control both.

I hereby declare that rights under contract or law have been conveyed to and remain with the small business concern identified above with regard to the invention entitled: "AN APPARATUS, A SYSTEM AND A METHOD FOR POSITION MONITORING AND/OR CLEANING OF A MACHINE ELEMENT" by inventor(s) Bradley Engstrand as described in

☒ the specification filed herewith

☐ application Serial No. \_\_\_\_\_, filed \_\_\_\_\_

☐ Patent No. \_\_\_\_\_, issued \_\_\_\_\_

If the rights held by the above-identified small business concern are not exclusive, each individual, concern or organization having rights to the invention is listed below and no rights to the invention are held by any person, other than the inventor, who would not qualify as an independent inventor under 37 CFR 1.9(c) or by any concern which would not qualify as a small business concern under 37 CFR 1.9(d) or a nonprofit organization under 37 CFR 1.9(e). NOTE: Separate verified statements are required from each named person, concern or organization having rights to the invention averring to their status as small entities. (37 CFR 1.27).

NAME \_\_\_\_\_

ADDRESS \_\_\_\_\_

☐ INDIVIDUAL

☒ SMALL BUSINESS CONCERN

☐ NONPROFIT ORGANIZATION

I acknowledge the duty to file, in this application or patent, notification of any change in status resulting in loss of entitlement to small entity status prior to paying, or at the time of paying, the earliest of the issue fee or any maintenance fee due after the date and which status as a small entity is no longer appropriate. (37 CFR 1.28(b)).

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application, any patent issuing thereon, or any patent to which this verified statement is directed.

NAME OF PERSON SIGNING Bradley Engstrand

TITLE OF PERSON OTHER THAN OWNER \_\_\_\_\_

ADDRESS OF PERSON SIGNING 1020 Western Drive, Hartford, Wisconsin 53027

SIGNATURE Bradley Engstrand DATE 8-24-00

S P E C I F I C A T I O N

TITLE

5 "AN APPARATUS, A SYSTEM AND A METHOD FOR POSITION  
MONITORING AND/OR CLEANING OF A MACHINE ELEMENT"

BACKGROUND OF THE INVENTION

10 The present invention generally relates to an  
apparatus, a system and a method for measuring position of  
a machine element and/or cleaning a machine element. More  
specifically, the present invention relates to an apparatus  
providing a sensor capable of detecting the position of a  
machine element within a mechanical system as well as  
providing a means for preventing and/or eliminating the  
accumulation of contaminants onto a machine element, such  
15 as a piston rod, or the like. In addition, the present  
invention provides a system and a method for measuring  
position of a machine element as well as a system and a  
method for prevention of contaminant accumulation onto a  
machine element.

20 It is, of course, generally known to measure position  
of a machine element in a mechanical system. System  
monitoring may lead to detection of irregularities within  
the system as well as an indication of the overall  
efficiency of the system. However, known monitoring  
25 systems generally utilize a sensor whereby contact is made  
between the sensor and the moving machine element.  
Moreover, extra components, such as sensors, attached to  
moving parts of a mechanical system may decrease the  
efficiency of the system. In addition, it is generally  
30 known to clean machine elements to prolong their period of  
use. Accumulation of contaminants onto machine elements  
can increase the wear on a machine element and decrease the  
period of use within a mechanical system. Furthermore, the  
accumulation of debris on a machine element may also  
35 decrease the efficiency of the machine element as well as  
the overall efficiency of the mechanical system.

A need, therefore, exists for an improved measurement device, system and method for monitoring position of a machine element within a mechanical system. Moreover, a need exists for an improved device, system, and method for preventing accumulation of contaminants onto machine elements.

SUMMARY OF THE INVENTION

The present invention provides an apparatus, system and method for monitoring position of a machine element in a mechanical system and preventing accumulation of contaminants onto a machine element, such as a piston rod.

In an embodiment of the present invention, an apparatus for measuring displacement is provided. The apparatus may have a machine element having an interior wall and an exterior wall and further having an end wall substantially enclosing the interior wall and the exterior wall. The apparatus may further have a shaft element movable within the machine element. In addition, the apparatus may have a head element attached to the shaft element adjacent to the interior wall of the machine element. The apparatus may further have a light source attached to the machine element. Lastly, the apparatus may have a sensor attached to the machine element and positioned to detect intensity of light within the machine element.

In an embodiment, the apparatus has a coating on the shaft element.

In an embodiment, the apparatus has a coating on the interior wall of the machine element.

In an embodiment, the apparatus has a seal disposed around the shaft element.

In an embodiment, the apparatus has a first brush positioned at the end wall of the machine element.

In an embodiment, the first brush is constructed from wire.

In an embodiment, the apparatus has a second brush

positioned at the end wall of the machine element.

In an embodiment, the first brush is constructed from bronze.

5 In another embodiment of the present invention an apparatus for cleaning a machine component is provided. The apparatus has a machine element having an interior wall and an exterior wall and further having an end wall substantially enclosing the interior wall and the exterior wall. The apparatus further has a shaft element movable  
10 within the machine element. In addition, the apparatus has a head element attached to the shaft element and adjacent to the interior wall of the machine element. Lastly, the apparatus has a first brush positioned at the end wall of the machine element in contact with the shaft element.

15 In an embodiment, the apparatus has a seal disposed around the shaft.

In an embodiment, the apparatus has a coating on the shaft element.

20 In an embodiment, the apparatus has a second brush positioned at the end wall of the machine element.

In an embodiment, the apparatus has a light source attached to the machine element.

25 In another embodiment of the present invention, a method for measuring displacement of a machine element is provided, the method has the step of providing a machine element having an interior and an exterior wall and further having an end wall. The method further has the step of providing a shaft element capable of movement within the machine element. In addition, the method has the step of  
30 attaching a head element to the shaft element. The method further has the step of positioning the head element adjacent to the interior wall of the machine element. Also, the method has the step of attaching a light source to the machine element. The method further has the step of  
35 attaching a sensor to the machine element. Lastly, the method has the step of measuring intensity of light within

the machine element from reflected light detected by the sensor.

5 In an embodiment, the method further has the steps of moving the shaft element and producing an output signal as the shaft element moves within the machine element.

In an embodiment, the method further has the steps of providing a processing unit that receives the output signal and displaying the output signal.

10 In an embodiment, the method further has the step of positioning a seal at the end wall of the machine element.

In an embodiment, the method further has the step of attaching a first brush to the machine element.

In an embodiment, the method further has the step of attaching a second brush to the machine element.

15 It is, therefore, an advantage of the present invention to provide an apparatus, a system and a method for measuring the position of a machine element within a mechanical system, such as a pneumatic or hydraulic cylinder or the like, without contacting the moving machine element.

20 Another advantage of the present invention is to provide an apparatus, a system and a method for measuring the position of a machine element within a mechanical system, that does not affect the motion of a machine element within a mechanical system.

25 Yet another advantage of the present invention is to provide an apparatus, a system and a method for measuring the position of a machine element within a mechanical system to allow detection of irregularities within the system.

30 Still another advantage of the present invention is to provide an apparatus, a system and a method for measuring the position of a machine element within a mechanical system to provide an indication of the overall efficiency of the mechanical system.

35 Another advantage of the present invention is to

provide an apparatus, a system and a method for cleaning a machine element.

5 Still another advantage of the present invention is to provide an apparatus, a system and a method for cleaning a machine element allowing for a longer period of use of the machine element.

10 Yet another advantage of the present invention is to provide an apparatus, a system and a method for cleaning a machine element that provides increased efficiency of the machine element.

Another advantage of the present invention is to provide an apparatus, a system and a method for cleaning a machine element that provides increased overall efficiency of a mechanical system.

15 Additional features and advantages of the present invention are described in, and will be apparent from, the detailed description of the presently preferred embodiments and from the drawings.

#### BRIEF DESCRIPTION OF THE DRAWINGS

20 Figure 1 illustrates a cross-sectional view of a cylinder showing sensor placement and cleaning elements of an embodiment of the present invention.

Figure 2 illustrates a black box diagram of an embodiment of the system of the present invention.

#### 25 DETAILED DESCRIPTION OF THE PRESENTLY PREFERRED EMBODIMENTS

The present invention generally relates to an apparatus, a system and a method for measuring position of a machine element and/or cleaning of a machine element, such as a piston rod or the like.

30 Referring now to the drawings wherein like numerals refer to like parts, Figure 1 illustrates a cylinder machine element 10 having a shaft element 12 and a head 14 that operates cooperatively with the cylinder 10 in a manner well-known to one of ordinary skill in the art. The  
35 cylinder 10 may preferably be hydraulic or pneumatic. The



cylinder 10 may also be any other type of cylinder known to one of ordinary skill in the art.

5 The cylinder 10 further may have an end wall 15 that may be perpendicular to the shaft 12 and that may substantially enclose the cylinder 10. The end wall 15 may surround the shaft 12. A light source 18 may be positioned on the end wall 15 of the cylinder 10 with the light from the light source 18 projecting into the interior of the cylinder 10. The light source 18 may be an LED light source or any other light source known by those skilled in the art. In addition, a light sensor 20 may also be placed on the end wall 15 of the cylinder 10 with the detecting portion of the sensor 20 directed towards the interior of the cylinder 10. The light sensor 20 measures the intensity of light within the cylinder 10 emitted by the light source 18 into the interior of the cylinder 10.

15 The cylinder 10 has an interior wall 16. The interior wall 16 may be coated with a substance 19 that may absorb a portion of the light emitted from the light source 18. 20 The light absorbing coating 19 may be an anodizing compound. The surface 17 of the head 14 may also be coated with the light absorbing substance 19 or may be covered with a nitrile compound or other coating known by those skilled in the art to be light absorbing. Furthermore, the surface 24 of the shaft 12 may also be coated with a light absorbing substance 21 such as a nitrile compound, ceramic compound, or any other compound known by those skilled in the art to be coated onto a shaft that may also provide light absorbing and contaminant preventative properties. 25 The coatings 19, 21 may have various colors that may affect and/or control the amount of light absorption. 30

35 As the head 14 and the shaft 12 transverse through the cylinder 10, a portion of the light emitted from the light source 18 may be absorbed by the coating 19 on the interior wall 16. A portion of the light emitted by the light source 18 may also be absorbed by the coating 19, 21 on the

head surface 17. Lastly, a portion of the light emitted by the light source 18 may be absorbed by the coating 21 on the shaft surface 24. The light sensor 20 measures the intensity of light within the interior of the cylinder 10 that is not absorbed by the coatings 19, 21. The light sensor 20 may then transmit a signal indicative of the intensity to a processor 104, represented in Figure 2. The processor 104 may be programmed to translate the measured intensity of the light emitted by the light source 18 that is within the cylinder 10 into a position measurement of the head 14 or shaft 12 within the cylinder 10.

In an alternate embodiment of the present invention, the cylinder 10 may have a groove 30 within an interior of an opposing end wall 32. Located within the groove 30 may be an additional light source 18 and/or an additional sensor 20. An advantage of placing the additional light source 18 and the additional sensor 20 within the groove may be to prevent the shaft element 12 and the head 14 from closing off the light path as the shaft element 12 and the head 14 move throughout the cylinder. A further advantage of placing the additional light source 18 and the additional sensor 20 within the opposing end wall 32 may be to obtain an average of two sensor readings which may provide greater accuracy in position measurement. In addition, the groove 30 may also be placed within the end wall 15 with the light source 18 and the sensor 20 placed within the groove 30.

Figure 2 illustrates, in a black box diagram, an embodiment of a system 100 of the present invention. The system 100 includes a sensor 102 which may detect the intensity of light emitted by the light source 18 within the interior of the cylinder 10 that is not absorbed by the coatings 19, 21 within the system 100. An output signal from the sensor 102 may be transmitted to the processor 104 for signal interpretation and/or processing. The processor 104 may determine the position of the shaft 12 or head 14

within the cylinder 10.

A display unit 105 may be provided to display the absolute or relative position of the sensed shaft 12. A printer 106 may also be provided to print the results of the absolute or relative position of the shaft 12.

The processor 104 may be connected to a controller 108. After the output signal of the sensor 102 is processed by the processor 104, a signal may be transmitted to the controller 108. The controller 108 may then adjust the position of a machine element 110, such as a valve, which may affect the movement of the shaft 12 within the cylinder 10. The new position of the shaft 12 may provide the sensor 102 with a subsequent measurement which may eventually be processed by the processor 104 and may determine whether the machine element 110 may be adjusted to affect the position of the shaft 12 within the cylinder 10.

Figure 1 also illustrates a seal 22 which may be engaged onto the shaft 12. The seal 22 may be positioned near the end wall 15 of the cylinder 10. The seal 22 may be made from, for example, rubber. A first brush 26 may be positioned near the end wall 15 of the cylinder 10 as illustrated in Figure 1. The first brush 26 may be a wire brush, preferably made from, for example, steel or any other metal or other material known by one of ordinary skill in the art. A second brush 28 may also be positioned near the end wall 15 of the cylinder 10 diametrically opposed to the first brush 26. The second brush may be made from, for example, bronze or any other metal or other material known by one of ordinary skill in the art.

The first brush 26 and the second brush 28 may be in contact with the surface 24 of the shaft 12. As the shaft 12 moves laterally through the cylinder 10, the first brush 26 and the second brush 28 may scrape contaminants, such as weld spatter, which may be deposited onto the surface 24 of the shaft 12. By scraping contaminants from the shaft 12,

the first brush 26 and the second brush 28 allow the shaft 12 to move more efficiently through the cylinder, thus providing more accurate position measurements. The coating 21 on the surface 24 of the shaft 12 may be a nitrile coating, a ceramic coating or any other coating known by those skilled in the art capable of light absorption and also capable of preventing and/or reducing the accumulation of contaminants onto a surface 24 of the shaft 12.

The various embodiments of the present invention may be operated by any power supply known by those skilled in the art. In addition, the various embodiments may be operated in remote locations through the use of a small electric generator, from a pressurized air line, or the like.

It should be understood that various changes and modifications to the presently preferred embodiments described herein will be apparent to those skilled in the art. Such changes and modifications may be made without departing from the spirit and scope of the present invention and without diminishing its attendant advantages. It is, therefore, intended that such changes and modifications be covered by the appended claims.

I claim:

1. An apparatus for measuring displacement, the apparatus comprising:

a machine element having an interior wall and an exterior wall and further having a first end wall substantially enclosing the interior wall and the exterior wall;

a shaft element movable within the machine element;

a head element attached to the shaft element adjacent to the interior wall of the machine element;

a light source attached to the machine element; and

a sensor attached to the machine element and positioned to detect intensity of light within the machine element.

2. The apparatus of Claim 1 further comprising:

a coating on the shaft element.

3. The apparatus of Claim 1 further comprising:

a coating on the interior wall of the machine element.

4. The apparatus of Claim 1 further comprising:

a seal disposed around the shaft element.

5. The apparatus of Claim 1 further comprising:

a second end wall opposite to the first end wall wherein the second end wall has a groove.

6. The apparatus of Claim 1 further comprising:

a first brush positioned at the end wall of the machine element.

7. The apparatus of Claim 6 wherein the first brush is constructed from wire.

8. The apparatus of Claim 1 further comprising:

a second brush positioned at the end wall of the machine element.

9. The apparatus of Claim 8 wherein the second brush is constructed from bronze.

10. The apparatus of Claim 1 further comprising:

an additional sensor attached to the machine element and positioned to detect intensity of light within the machine element.

11. An apparatus for cleaning a machine component, the apparatus comprising:

a machine element having an interior wall and an exterior wall and further having an end wall substantially enclosing the interior wall and the exterior wall;

a shaft element movable within the machine element;

a head element attached to the shaft element and adjacent to the interior wall of the machine element; and

a first brush positioned at the end wall of the machine element in contact with the shaft element.

12. The apparatus of Claim 11 further comprising:

a seal disposed around the shaft.

13. The apparatus of Claim 11 further comprising:

a coating on the shaft element.

14. The apparatus of Claim 11 further comprising:

a second brush positioned at the end wall of the machine element.

15. The apparatus of Claim 11 further comprising:

a light source attached to the machine element.

16. The apparatus of Claim 11 further comprising:

a sensor positioned to receive reflected light within the machine element.

17. A method for measuring displacement of a machine element, the method comprising the steps of:

providing a machine element having an interior and an exterior wall and further having an end wall;

providing a shaft element capable of movement within the machine element;

attaching a head element to the shaft element;

positioning the head element adjacent to the interior wall of the machine element;

attaching a light source to the machine element;

attaching a sensor to the machine element; and

measuring intensity of light within the machine element from reflected light detected by the sensor.

18. The method of Claim 17 further comprising the steps of:  
moving the shaft element; and  
producing an output signal as the shaft element moves within the machine element.
19. The method of Claim 17 further comprising the steps of:  
providing a processing unit that receives the output signal; and  
displaying the output signal.
20. The method of Claim 17 further comprising the step of:  
positioning a seal at the end wall of the machine element.
21. The method of Claim 17 further comprising the step of:  
attaching a first brush to the machine element.
22. The method of Claim 17 further comprising the step of:  
attaching a second brush to the machine element.

ABSTRACT OF THE DISCLOSURE

An apparatus, a system and a method are provided for monitoring position of a machine element within a mechanical system and/or cleaning a machine element. A light source and sensor may be positioned within a cylinder. The sensor may detect the intensity of light within the cylinder as a shaft element moves laterally throughout the cylinder. The measurement may indicate the position of the shaft element within the cylinder. In addition, a seal, a wire brush and/or a bronze brush may be placed near an end wall of a cylinder. The seal may surround the shaft element. Furthermore, the shaft element may be coated with a compound, such as a nitrile compound or a ceramic compound or the like. The wire brush and bronze brush may be in contact with the shaft element and may scrape any contaminants, such as weld spatter, which may be deposited on the shaft element.



FIG.1

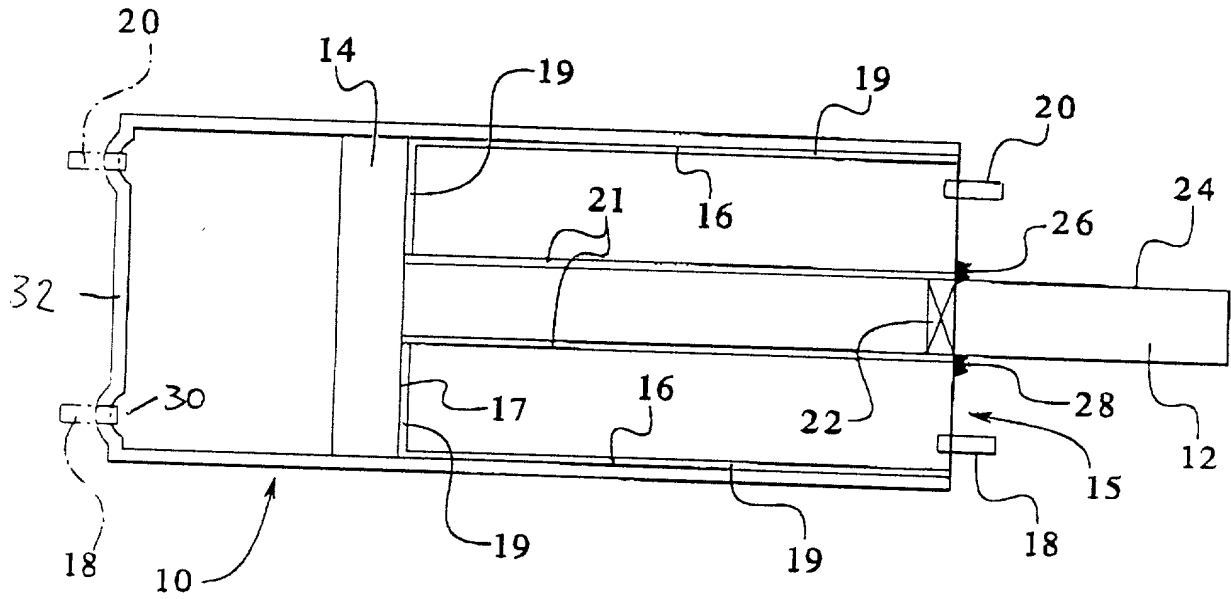
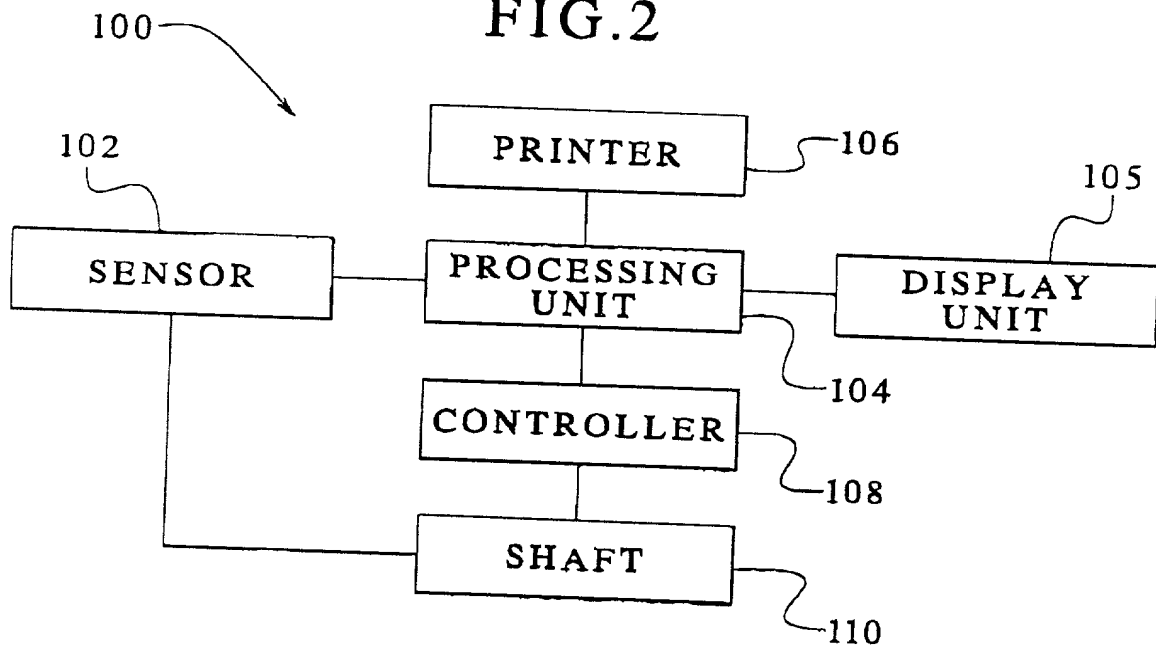


FIG.2



## DECLARATION AND POWER OF ATTORNEY

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name,

I believe I am the original, first and sole inventor of the subject matter which is claimed and for which a patent is sought on the invention entitled:

### **"AN APPARATUS, A SYSTEM AND A METHOD FOR POSITION MONITORING AND/OR CLEANING OF A MACHINE ELEMENT"**

Case No. MOT-P-00-001, the specification of which

X is attached hereto.  
\_\_\_\_\_ was filed on \_\_\_\_\_, as  
Application Serial No. \_\_\_\_\_.  
and was amended on \_\_\_\_\_.

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims as amended by any amendment referred to above.

I acknowledge the duty to disclose to the United States Patent Office all information which is known to me to be material to the patentability of this application in accordance with Title 37, Code of Federal Regulations, 1.56(a)<sup>1</sup>.

I do not know and do not believe this invention was ever known or used in the United States of America before my or our invention thereof, or patented or described in any printed publication in any country before my or our invention thereof or more than one year prior to this application, that the same was not in public use or on sale in the United States of America more than one year prior to this application, and I believe that the invention has not been patented or made the subject of an inventor's certificate issued before the date of this application in any country foreign to the United States of America on an application filed by me or my legal representatives or assigns more than twelve months prior to this application, and that no application for patent or inventor's certificate on this invention has been filed in any country foreign to the United States of America prior to this application by me or my legal representatives or assigns, except as identified below:

I hereby claim foreign priority benefits under Title 35, United States Code, 119 of any foreign application(s) for patent or inventor's certificate listed below:

---

<sup>1</sup>(b) Under this section, information is material to patentability when it is not cumulative to information already of record or being made of record in the application, and

(1) It establishes, by itself or in combination with other information, a *prima facie* case of unpatentability of a claim; or

(2) It refutes, or is inconsistent with, a position the applicant takes in:

(i) Opposing an argument of unpatentability relied on by the Office, or

(ii) Asserting an argument of unpatentability.

A *prima facie* case of unpatentability is established when the information compels a conclusion that a claim is unpatentable under the preponderance of evidence, burden-of-proof standard, giving each term in the claim its broadest reasonable construction consistent with the specification, and before any consideration is given to evidence which may be submitted in an attempt to establish a contrary conclusion of patentability.

Prior Foreign Application(s)

Number

Country

Date

and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the above listed application on which priority is claimed:

Prior Foreign Application(s)

Number

Country

Date

If no priority is claimed, I have identified all foreign patent applications filed prior to this application:

Prior Foreign Application(s)

Number

Country

Date

And I hereby appoint Brian M. Mattson (Reg. No. 35, 018) of the firm of Patents+TMS, A Professional Corporation as my attorney with full power of substitution and revocation, to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith and direct that all correspondence be forwarded to:

Patents+TMS  
A Professional Corporation  
1914 N. Milwaukee Avenue  
Third Floor  
Chicago, IL 60647  
Telephone: 773/772-6009

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Full name of sole or first inventor BRADLEY ENGSTRAND

Inventor's signature *Bradley W. Engstrand* Date 8-24-00

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